

### REMARKS

Claims 1-12 are pending in the present Application. With entry of this Amendment, claims 4, 9 and 12 are canceled and claims 13-19 are added.

Claims 1 and 10 have been amended to specify the components of the electrolytic copper plating solution as well as the thiol-reactive compound. These amendments are fully supported by the Specification at: Example 3; page 5, lines 2-14; page 10, lines 10-15 and 22-32; page 12, lines 12-22; and by original claims 4 and 12. Claim 5 has been amended only to change its dependency. Claim 6 has been amended to recite positive steps. This amendment is fully supported by the Specification at Example 3 and page 17, lines 16-25. Claim 7 has been amended only to provide consistent preamble language. Newly added claims 13, 16, and 19 are supported by the Specification at page 10, lines 30-32. Support for new claims 14 and 17 is found in the Specification at page 10, lines 28-29. New claims 15 and 18 are supported by the Specification at page 5, lines 2-6. No new matter is added with this amendment.

The official action requested a drawing to facilitate understanding of the invention. Applicants note that a description of a drawing is provided in the Specification at page 4, lines 25-32, but that no drawing is in the Application. Applicants are claiming an electrolytic copper plating solution and methods of electroplating copper using such solution. Applicants do not believe a drawing is necessary to facilitate understanding of their invention. One skilled in the art reading the instant Application would clearly understand the present invention without need of a drawing. The results that are stated to appear in Figs. 1 and 2 are sufficiently described in Examples 2 and 3 to allow one skilled in the art to understand such results without recourse to the drawing. Accordingly, Applicants have deleted from the Application all reference to the drawing. Applicants respectfully request that this requirement be withdrawn.

The Specification has been objected to because of a few typographical errors on pages 6, 16 and 18. These objections have been mooted by the present Amendment and Applicants respectfully request that this objection be withdrawn.

Claims 7 and 10 have been objected to because of typographical errors in lines 1 and 2, respectively. These objections have been made moot by the present Amendment. Applicants respectfully request that this objection be withdrawn.

Claims 1-12 have been rejected under 35 USC § 112, second paragraph, as being indefinite for failing to point out particularly and claim distinctly the subject matter which Applicants regard as their invention. Applicants submit that this rejection is mooted by the present Amendment and respectfully request that this rejection be withdrawn.

Claim 9 has been rejected under 35 USC § 102(b) as being anticipated by Sonnenberg et al. Claim 9 is canceled with this Amendment. Therefore, Applicants respectfully request that this rejection be withdrawn.

Claims 1-4 and 6-7 have been rejected under 35 USC § 102(b) as being anticipated by Kardos et al. Applicants respectfully traverse.

Kardos et al. disclose copper electroplating baths containing an N-heteroaromatic compound, such as pyridine. Applicants' claimed thiol-reactive compound does not include either aromatic compounds or heteroaromatic compounds. None of Applicants' thiol-reactive compounds are disclosed in the Kardos et al. patent. Thus, Applicants' claimed invention is not anticipated by Kardos et al. and Applicants respectfully request that these rejections be withdrawn.

Claim 5 has been rejected under 35 USC § 103(a) as being unpatentable over Kardos et al. Applicants respectfully traverse.

As discussed above, Kardos et al. disclose copper plating baths containing an N-heteroaromatic compound. Applicants' claimed copper electroplating baths exclude such compounds as the thiol-reactive compound. Further, Kardos et al. fail to disclose or suggest any of Applicants' claimed thiol-reactive compounds. Accordingly, since Kardos et al. do not

suggest Applicants' claimed thiol-reactive compounds, neither do they suggest the concentration of Applicants' claimed thiol-reactive compounds. Applicants submit that the Examiner has not made out a prima facie case of obviousness and respectfully request that this rejection be withdrawn.

Claims 8 and 10-12 have been rejected under 35 USC § 103(a) as being unpatentable over Kardos et al. in view of Sonnenberg et al. Applicants respectfully traverse.

The Kardos et al. patent is discussed above.

Sonnenberg et al. fail to fill the deficiencies of Kardos et al. The Sonnenberg patent is directed to copper plating baths containing a brightener and a heterocyclic leveler. Applicants' claims exclude heterocyclic compounds as the thiol-reactive compound. Further, Sonnenberg et al. fail to disclose or suggest Applicants' claimed thiol-reactive compounds.

If one were to combine these references, one would obtain a copper plating bath containing a heterocyclic compound. There is nothing in either reference alone or in combination that teaches or suggests Applicants' claimed copper plating baths comprising Applicants' claimed thiol-reactive compounds. Applicants submit that the Examiner has not made out a prima facie case of obviousness and respectfully request that this rejection be withdrawn.

Applicants respectfully request favorable reconsideration in the form of a notice of allowance.

Respectfully submitted,

A handwritten signature in cursive script that reads "S. Matthew Cairns".

S. Matthew Cairns, Ph.D.

Attorney for Applicant

Registration No. 42,378

c/o EDWARDS & ANGELL  
Dike, Bronstein, Roberts & Cushman IP Group  
PO Box 9169  
Boston, MA 02209  
Date: